REMARKS

Applicant thank the Examiner for holding a phone interview with the attorney of record on April 25, 2008 to discuss the application. After reviewing the cited prior art and the last submitted amended claims, the Examiner indicated that a further restriction regarding the linear electrical properties of the invention would distinguish the claims from the cited art. Accordingly, the independent claims 1 and 3 have been so amended.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Claims 3-6 are rejected under 35 U.S.C. § 102(b) as being anticipated by Terai et al. and Fink et al. Claims 1-3 and 7-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Terai et al. and Fink et al. in view of Bureau et al.

This invention discloses a method of fabricating a strain sensor by irradiating a polymer to change its electrical properties. The irradiation intensity is kept below 10^{15} cm^{-2}. This ensures that the irradiated area is not conducting but is in the semiconductor range. See page 9 lines 16 - 22 of the specification.

The discovery on which this invention is partly based is that in this state of non-conductance the response to strains and stress gives a measurable electrical signal that is linear with increasing strain. See page p 9 line 26 to p 10 line 8 of the specification. Conducting tracks are deposited onto the treated portion to enable the sensor to be connected to an external electric circuit and serve as a strain sensor.

Prior to this invention it was not realized that non conducting polymers exhibited strain dependent properties. For polymers irradiation does not produce conducting polymers until the fluence is above $1x10^{15}cm^{-2}$.

The prior art was concerned with creating conductive polymers that exhibited strain dependent properties in a similar fashion to metals which are also conductors. In the prior art there was no understanding that non conductive polymers exhibited strain dependent properties.

Regarding the rejections, the paper by Terai et al uses irradiation within the range claimed in this invention but there is no suggestion that this results in properties that make the film useful in measuring strain. Rather, as shown in Fig 2 and explained at the bottom of pg. 628, the wide range of fluence was to establish the experimental ratios of oxygen to carbon and nitrogen to carbon obtained from XPS spectra. On page 631, the conclusions of the experiments led to the observance of several changes to the structure and properties of the polyimide film used but none of the conclusions even suggested a linear strain sensing response. The Terai reference has no conductor tracks or leads connected so as to serve as an electrical component. Rather, Terai is exposed to a wide range of fluence to explore how the material changes certain characteristics that are not related to linear electrical property changes.

The Examiner has misread Terai at page 630. The reference to irradiation at $7x10^{13}cm^{-2}$ relates to the irradiation of diamonds reported in a prior reference. Terai also observes an abrupt decrease in resistance due to percolation resistance but in polymers it is above $1x10^{15}cm^{-2}$ (see page 630, last 3 lines - page 631 first paragraph)

The patent to Fink discloses that conductivity decreases with lower irradiation energies but says nothing about strain dependent properties

Patent 5437195 (Bureau) discloses that strain sensors can be produced by irradiation but the radiation used is above 10^{16} cm^{-2} which produces an electrically conductive material. In this regard, see col 3 lines 9-22 and figure 2 and also col 3 line 62 to col 4 line 4. There is no suggestion in this patent that radiation below this intensity will produce useful strain measurement characteristics. Without the suggestion that useful strain measurements can be had from polymers irradiated below 10^{15} cm^{-2} the skilled reader would see no advantage in using a lower radiation intensity than that disclosed by Bureau.

The Terai and Fink references do not deal with a material that has been treated in a manner that will respond linearly to physical stress. More precisely, neither of these references taken singly, or in any reasonable combination, teach or suggest the discovery on which this invention is based. Namely, a material as claimed having a conductance range capable of

exhibiting a response to strains and stress that gives a measurable electrical signal that is linear with increasing strain and to which conductor tracks or leads are deposited to allow the material to serve as an electrical strain sensor component, The Bureau reference is directed to a strain gauge *per se* and is made of an irradiated material but at radiation levels well in excess of the claims.

Therefore, the Examiner has failed to provide a logical connection between the references and is simply relying on impermissible hindsight.

> "Measuring a claimed invention against the standard established by section 103 requires the oft-difficult but critical step of casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field."

In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). [The Examiner] 'cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.' *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1780, 1783 (Fed. Cir. 1988)." *Ecolochem, Inc. v. Southern California Edison Company,* (CAFC 2000).

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to CBLH Deposit Account No. 22-0185, under Order No. 21854-00075-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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